

WHAT IS CLAIMED IS:

1. A ladder type filter comprising:
a filter element including at least one series resonator and at least one parallel resonator arranged in a ladder configuration, said at least one series resonator having an inductor connected in parallel thereto; wherein
an anti-resonant point on the lower frequency side of the resonant point of the at least one series resonator, caused by the inductor connected in parallel, and the resonant point of the at least one parallel resonator substantially coincide with each other.
2. A ladder type filter according to Claim 1, wherein the at least one parallel resonator includes at least two resonators connected in parallel to each other.
3. A ladder type filter according to Claim 1, wherein the at least one parallel resonator includes at least two resonators connected in series with each other.
4. A ladder type filter according to Claim 1, wherein the at least one series resonator includes at least two resonators connected in series with each other.
5. A ladder type filter according to Claim 1, wherein the at least one series resonator includes at least two resonators connected in parallel to each other.

6. A ladder type filter according to Claim 1, wherein the inductor includes at least one of a chip coil and a bonding wire.

7. A ladder type filter according to Claim 1, wherein the filter element is mounted in a package, and the inductor includes a wiring arranged in the package.

8. A ladder type filter according to Claim 1, wherein the filter element is mounted in a package, and the inductor includes a wiring pattern disposed on a mounting substrate on which the package including the filter element is mounted.

9. A ladder type filter according to Claim 1, wherein the at least one series resonator has a capacitance of about 0.8 pF to about 3 pF.

10. A ladder type filter according to Claim 1, wherein the at least one parallel resonator has a capacitance of about 1 pF to about 9.5 pF.

11. A ladder type filter according to Claim 1, wherein at least one of the at least series resonator and the at least one parallel resonator is a one terminal-pair surface acoustic wave resonator including a plurality of interdigital electrode portions provided on a piezoelectric substrate, and the filter element is a surface acoustic wave element.

12. A ladder type filter according to Claim 1, wherein at least one of the at least series resonator and the at least one parallel resonator is a piezoelectric thin-film resonator including a substrate having an aperture or concavity provided therein, and a vibrating portion arranged over the aperture or concavity, said

vibrating portion includes at least one layer of a piezoelectric thin film and at least one pair of an upper electrode and a lower electrode, and said piezoelectric thin film is sandwiched between the upper electrode and the lower electrode such that the upper and lower electrodes are opposed to upper and lower surfaces of the piezoelectric thin film, respectively, and the filter element is a piezoelectric thin film filter element.

13. A branching filter comprising the ladder type filter of Claim 1 which defines a filter having a pass-band on a higher frequency side of the branching filter.

14. A communication device comprising the ladder type filter of Claim 1.

15. A communication device comprising the branching filter of Claim 13.

16. A ladder type filter comprising:

a filter element including at least one series resonator and at least one parallel resonator arranged in a ladder configuration, said at least one parallel resonator having a first inductor connected in series therewith, and said at least one series resonator having a second inductor connected in parallel thereto; wherein

a resonant point of the at least one parallel resonator is shifted toward the lower frequency side by the first inductor connected in series thereto, and an anti-resonant point on the lower frequency side of the resonant point of the at least one series resonator, caused by the second inductor connected in parallel, substantially coincide with each other.

17. A ladder type filter according to Claim 16, wherein the at least one parallel resonator includes at least two resonators connected in parallel to each other.

18. A ladder type filter according to Claim 16, wherein the at least one parallel resonator includes at least two resonators connected in series with each other.

19. A ladder type filter according to Claim 16, wherein the at least one series resonator includes at least two resonators connected in series with each other.

20. A ladder type filter according to Claim 16, wherein the at least one series resonator includes at least two resonators connected in parallel to each other.

21. A ladder type filter according to Claim 16, wherein the inductor includes at least one of a chip coil and a bonding wire.

22. A ladder type filter according to Claim 16, wherein the filter element is mounted in a package, and the inductor includes a wiring arranged in the package.

23. A ladder type filter according to Claim 16, wherein the filter element is mounted in a package, and the inductor includes a wiring pattern disposed on a mounting substrate on which the package including the filter element is mounted.

24. A ladder type filter according to Claim 16, wherein the series resonator has a capacitance of about 0.8 pF to about 3 pF.

25. A ladder type filter according to Claim 16, wherein the parallel resonator has a capacitance of about 1 pF to about 9.5 pF.

26. A ladder type filter according to Claim 16, wherein at least one of the at least series resonator and the at least one parallel resonator is a one terminal-pair surface acoustic wave resonator including a plurality of interdigital electrode portions provided on a piezoelectric substrate, and the filter element is a surface acoustic wave element.

27. A ladder type filter according to Claim 16, wherein at least one of the at least series resonator and the at least one parallel resonator is a piezoelectric thin-film resonator including a substrate having an aperture or concavity provided therein, and a vibrating portion arranged over the aperture or concavity, said vibrating portion includes at least one layer of a piezoelectric thin film and at least one pair of an upper electrode and a lower electrode, and said piezoelectric thin film is sandwiched between the upper electrode and the lower electrode such that the upper and lower electrodes are opposed to upper and lower surfaces of the piezoelectric thin film, respectively, and the filter element is a piezoelectric thin film filter element.

28. A branching filter comprising the ladder type filter of Claim 16 which defines a filter having a pass-band on a higher frequency side of the branching filter.

29. A communication device comprising the ladder type filter of Claim 16.
30. A communication device comprising the branching filter of Claim 28.